1A Human factors in fire fighting

- "Safety net" → one solution?
- Do we realize: behavior in danger irrational
- Mindfulness
- Admitting we all make mistakes → how to handle with that → how we minimize risks → the balance
    - → we are allowed to make mistakes ← change of the safety culture
- Incident lessons learned system
    - +positive - negative
- Predictive modelling of behavior
- Mentoring, talking with peer
- Counseling
- Training and evaluation feedback
- Fact-based analyses of the operations → realistic feedback for the learning
- "Body cameras don't lie" → evaluation
- Checklist for tactical operations
- Recruitment of the operational staff, updating the criteria of the recruitment: social, psychological capabilities
- Trust values
- Gender equality and diversity
- Customer feedback
- Human resource co-operations

1B New technologies in fire fighting

- miten, tai pitäisikö, parantaa joukkueen taktiikkaa - ei niinkään sammutustekniikkaa/tekniikoita
- lisää tietoa palotilanteesta
    - missä palaa?
    - mitä muuta sisältä "löytyy"
    - tiedustelu + tilannekuva → RPAS ym.
- erilaiset drone -sovellukset, mm. sammuttaminen
    - työtä vielä tehtävänä: ohjaus, lämmönkesto
- ihmisen pelastaminen kuitenkin tärkein?
- Suomessa matalampi hierarkia; päätöksenteko tilanteessa jaettu "alemmas"
- OTKESin tutkimustiedon hyödyntäminen (tehokkaammin)
- a need for more software and data usage → still doing the same as we did in the '80s
- Localizing the fires becomes important → fastest routes etc.
- technologies integrated into the fire fighter's gear
  → Google classes or something
  → Seeing the building plans/maps in front of you
  → Added reality...enhanced reality
- "extra-skeleton" for more strength → wear it
- The use of robots in fires (e.g. Notre Dame) → the cost; how it works in sparsely populated areas?

- sensors that firefighters wear/sensors in buildings etc. → linkage to other systems and data
- extinguishing automatic system
- building information modelling system → updating the models after the planning phase → restricted use
- bodycams; intelligent outfits in real time is situations
- fire forecasting tools (development still clumsy)
- crowd/evacuating forecast already in real-time (agent-based -modelling)
- predicting risk-targets
- Simulating scenarios for different situations/emergencies → what will happen if…?
- better surveillance equipment to detect people inside from outside (deference forces)
- moving surveillance "robots" - small but plenty (vs. Minority Report)
- rolling drones
- detecting fires inside building by fire alarms "working together", sending signals and using this info for location → exists already → using this only at the scene (no false alarms)
- sound detector system → hearing though the walls
- using surveillance cameras (information) for real-time footage of the situation → needs analysis and interpretation
  (LESS INFORMATION - MORE KNOWLEDGE)
- interpreting the information into meaningful knowledge of the situation → someone giving instructions on your ear how to proceed
- electromagnetic fields you could use to dissolve the e.g. smoke clouds

2A Evidence-based decision-making

- Self-reporting cars. health apps → data security and confidentiality can be solved
- monitoring and measuring human actions (looks, moves and so on) in a fireplace during rescue operations
- occupational safety, continuity management, environment safety etc. → fire departments risk management
- All functions in rescue service could and should benefit from evidence-based decision-making
- physiology, occupational health
- hospital/health care
  - o käypä-hoito
- insurance companies,
  - o riskianalyysi
  - o → hinnoittelu
- sales, marketing/advertising
- public relations/communication
  - o → expectations
  - o potential targets
  - o safety campaigns → "neurostudies", mihin katsoja kiinnittää huomion esimerkiksi julisteessa/mainoksessa
- Aviation
- Railways
- construction, fire safety technology, fire protection engineering → which solutions/technology is effective

- o acceptable risk
- high-risk industries e.g. nuclear → risk-informed inspection
- situational awareness police
- "customer-based" decision making
  - o learning from other countries
  - o marketing inquiry
  - o customers need for the development of services
  - o learning how to manage "personal" information
  - o digital application for citizens to collect information about safety of the environment
- collecting data on an integrated system with different modules according to different purposes
- knowledge sharing

2B Big data, open data and analysis in fire and rescue services

- 1. Planning
  - o mobile phone data → massatapahtumat, evakuointi
  - o circumstances e.g. social
- 2. Prediction/perception risk
  - o säätiedotteet, ennusteet (IL)
  - o satelliittikuvat → kasvillisuus (metsäpalot)
  - o water outlets (GIS data)
  - o Fire inspection data, where risk targets are?
- 3. Response
  - o indoor positioning → cell phone data
  - o navigation to site with real time traffic information
- 4. Learning/evaluation
  - o data surveillance camera
  - o building information
  - o OPER toiminnasta kerättävä data → sensorit vaatteisiin → helmet camera
- rikostilastot
- työssäkäynti → päiväväestö
- credit card information → what people buy
- traveling information
- VKR:n väestötietojärjestelmä sekä rakennus ja huoneistorekisteri
- THL:n sotkanet indikaattoripankki
- national survey studies
  - o nuorisobarometri
  - o pelastuspalveluasenteet
  - o onnellisuusindeksi
- Risk analysis and management with data analysis
  - o → produce services analyse and prevent
  - o requires co-operation, knowledge, analysts and access to data from different platforms
  - o crossing the boundaries increase interdisciplinary
  - o risks are constantly changing → know the history
  - o improve communication
  - o improve data quality, standardization for better analyses, time and cost effectiveness

- o information should be structured according to the purpose